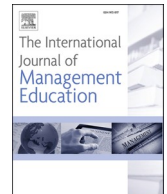




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Predictors of cheating in online exams among business students during the Covid pandemic: Testing the theory of planned behavior

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ABSTRACT

Drawing on the theory of planned behavior (TPB) and prior empirical research, this quantitative study aims to identify the main predictors of academic dishonesty in online exams among undergraduate business students during the COVID-19 pandemic in the United Arab Emirates (UAE). Complete data were collected through online questionnaire from 176 undergraduate business students from different UAE universities. Three proposed conceptual models were tested using structural equation modeling analysis (SEM). Results of SEM demonstrate that, in line with the TPB, students' favorable attitude toward cheating, social norms supportive of cheating, and perceived control over the engagement in cheating are the main predictors of cheating intentions in online exams among business students. This study shows that perceived control and cheating intentions are the direct predictors of actual cheating in online exams. The study also demonstrates that attitude toward cheating, social norms supportive of cheating, and perceived control over cheating indirectly influence actual cheating behavior in online exams. The findings of this study can help university administrators and faculty members understand and curb cheating during online exams among business students not only in the context of the continuing COVID-19 pandemic but also in the years ahead.

1. Introduction

Academic dishonesty, misconduct, unethical behavior, or cheating, call it what you may, most likely dates back to the beginning of education. Whatever the form, category, or method it is done in (Bowers, 1964; Griffin et al., 2015; Witherspoon et al., 2012), this phenomenon has long been a menacing problem in many universities and disciplines across the world (Ahmed, 2018; Bowers, 1964; Ferguson et al., 2022; Holden et al., 2020; McCabe, 2016; McCabe et al., 2006; Mensah & Azila-Gbette, 2018; Simkin & McLeod, 2010; Thomas & Jeffers, 2020). Recently, the phenomenon of academic dishonesty has been exacerbated as most universities were forced to move to full online modes of teaching due to the COVID-19 pandemic (Gamage et al., 2020; Holden et al., 2020; Hosseini et al., 2021). Even as the pandemic appears to be receding, many institutions continue conducting teaching activities online. For example, universities that used to offer only face-to-face degrees/classes have started offering or are planning to offer degrees/classes

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online. As online teaching is expected to grow in the foreseeable future it will likely bring with it an increase in e-assessments that are known to make it easier for students to have access to exam answers and/or receive unpermitted assistance from others (Bilen & Matros, 2021; Elsalem et al., 2021; Hosseini et al., 2021; Mellar et al., 2018; Walsh et al., 2021). Thus, cheating is bound to remain a major feature of online teaching in the years to come (Fask et al., 2014; Holden et al., 2020).

A major problem that posed serious concerns across all online courses, especially during the COVID-19 pandemic, is the issue of online examinations (Bilen & Matros, 2021; Clark et al., 2020; Elsalem et al., 2021; Gamage et al., 2020; Hosseini et al., 2021; Janke et al., 2021). As academic institutions shift to online teaching modes, the level of oversight and accountability often lags and triggers situations apt for cheating mostly due to the lack of clear policies from universities and/or the lack of technical skills, proctoring tools, and motivation to use these tools (e.g., Goff et al., 2020; Hosseini et al., 2021; Janke et al., 2021). For example, during the COVID-19 pandemic, academic institutions that were not prepared to go fully online, had to suddenly deal with online testing and scrambled to find programs and tools that allowed tests and exams to be conducted and managed online (Crawford et al., 2020; Eaton, 2020; Goff et al., 2020). However, as valuable as some of these proctoring tools (e.g., Respondus, Proctorio, ProctorU) can be, concern has been voiced regarding students not having access to technology to take online exams (e.g., high-speed Internet, laptops with cameras and microphones) (Woldeab et al., 2017), increasing stress and anxiety (Tindall & Curtis, 2020; Woldeab & Brothen, 2019), decreasing online exam grades (Alessio & Maurer, 2018), and invading privacy (Turnbull et al., 2021). Such issues have led some university students, for instance in the Netherlands and Australia, to sign petitions against using these proctoring tools (Doffman, 2020; Zhou, 2020).

Although academic integrity is a vital principle that should receive the highest priority regardless of the situation, the increasing pressure due to COVID-19 and the adoption of new assessment methods have resulted in unfamiliar and difficult situations that make it very hard to maintain a high level of academic integrity (Janke et al., 2021). For example, some instructors have employed non-invigilated online assessments which offered more opportunities for cheating and made it more difficult to spot instances of dishonesty (Bilen & Matros, 2021; Janke et al., 2021; Walsh et al., 2021). The increase in academic dishonesty, aptly referred to as a “trend” by Goff et al. (2020), “threaten(s) to create an unfair system where cheaters are rewarded with higher grades than non-cheaters, thereby encouraging otherwise honest students to cheat” (p. 248) (see also Bilen & Matros, 2021; McCabe et al., 1999, 2001). The increase in academic dishonesty and online assessments is not only making it easier and encouraging even for honest students to cheat (Bilen & Matros, 2021; Goff et al., 2020), but it is also expected to lead to “declining and erratic knowledge among university graduates, diminishing the value of a university education” (Goff et al., 2020, p. 246). Moreover, if the grades students receive do not accurately reflect their knowledge and abilities, then the university’s reputation and credibility/credentials are most likely to be affected negatively (Goff et al., 2020; Holden et al., 2020). The above negative outcomes are, in turn, most likely to have a detrimental impact on the workplace (Ghanem & Mozahem, 2019; Goff et al., 2020) and on the society at large as cheating “creates a mentality deprived of life satisfaction through hard work as well as incentives to live a dishonest life after college” (Von Jena, 2020, p. 2). The negative spillover from academic dishonesty to the workplace and other aspects of life is critical, especially among business students, as many of them are expected to become the leaders of tomorrow.

While recent empirical studies have contributed to our understanding of the online cheating problem, most of these studies have been conducted in Western countries (e.g., Bilen & Matros, 2021; Janke et al., 2021; Walsh et al., 2021) and none of them focused on identifying the predictors of online cheating during the COVID-19 pandemic among business students. Moreover, most of the research that deals with online cheating has largely been empirically driven rather than theory driven. Therefore, the purpose of this paper is to draw mainly on the theory of planned behavior (Ajzen, 1985, 1991) and prior empirical research findings on academic dishonesty (e.g., Harding et al., 2007; Mayhew et al., 2009; McCabe et al., 2008; McCabe & Treviño, 1993; McCabe & Treviño, 1997) to identify the significant predictors of academic dishonesty among university business students during the COVID-19 pandemic in a non-Western country, namely the UAE. The findings of this study will help university administrators and faculty members to understand the main factors that trigger students cheating and to address issues related to cheating not only in the context of the present pandemic but also in the years ahead. We focus on the UAE because it has witnessed an extraordinary increase in the number of higher education institutions in the last 20 years and has become a major hub for universities from all over the world (Ababneh, 2020; Ababneh & Hackett, 2019).

2. Literature review

Our literature review focuses on the prevalence of cheating in higher education in face-to-face and online settings, before and during the COVID-19 pandemic while it also contrasts student attitudes in the Middle East and North America. There is little doubt regarding the commonness of cheating in tertiary education. In one of the most influential and earliest studies that used data from more than 5000 students in 99 U.S. colleges/universities, it was reported that 75% of the students had engaged in one or more forms of cheating (Bowers, 1964). Replicating Bowers’ (1964) study, McCabe and Treviño (1993) found that 67% of the participants, 6096 junior and senior students from 31 US colleges/universities, admitted to one or more instances of cheating. Further strong evidence of the prevalence of cheating was provided by Whitley (1998) who reported an average of above 70% for total cheating frequency based on a meta-analysis review of 46 studies on cheating carried out between 1970 and 1996. Similarly, McCabe (2016) conducted a longitudinal study in U.S. universities from 2002 to 2013 and reported that cheating is common among undergraduate students.

The type of academic discipline and seniority of students appear to have little relevance to the act of cheating although its incidence varies according to these two variables. Further, international studies show differences in cheating behavior among students in different countries. For instance, in a study (McCabe et al., 2006) that examined cheating among business and nonbusiness graduate students in the U.S. and Canada, it was reported that 56% of business graduate students admitted to cheating while 47% of nonbusiness

graduate students admitted doing so. In Chapman and Lupton's (2004) comparison between US and Hong Kong university business students it was found that, while 55 percent of the American business students reported engagement in cheating during their undergraduate study, only 30 percent of the Hong Kong business students reported such behavior.

Following the onset of the COVID-19 pandemic the form of interaction between professors and students changed from the traditional face-to-face type to that of online interaction, the latter still being used across many universities. Thus, an interesting question in research on cheating has been whether one of the two types of interaction (that is, face-to-face and online), is likely to encourage and help students cheat. A number of studies compared the levels of cheating in face-to-face and online classes before the COVID-19 pandemic. Although both students and faculty believe that it is easier to cheat online than in a face-to-face setting (e.g., Goff et al., 2020; Kennedy, Nowak, Raghuraman, Thomas, & Davis, 2000; King & Case, 2014; King et al., 2009; Miller & Young-Jones, 2012; Walsh et al., 2021), studies that empirically examined whether students did indeed cheat more online than in face-to-face classes did not provide a clear conclusion. Precisely, while some researchers (e.g., Fask et al., 2014; Goff et al., 2020; King & Case, 2014; Lanier, 2006) found higher levels of cheating in online classes compared to face-to-face classes, other researchers (e.g., Grijalva et al., 2006; Watson & Sottile, 2010) found no significant difference between the two modes of classes, and still other researchers (Stuber-McEwen et al., 2009) found higher levels of cheating in face-to-face classes relative to online classes. Reviewing the above studies, Holden et al. (2020) and Janke et al. (2021) pointed out that the mixed results could be due to the fact that, while some studies focused on online cheating rates within some or all types of online assessments, the focus of other studies was specifically on exams. Notably, studies (e.g., Goff et al., 2020; King & Case, 2014) that clearly focused on the rates of cheating within exams found higher cheating in online exams compared to in-person exams (Janke et al., 2021). Therefore, future research must have a more specific focus if it is to offer a better understanding of the prevalence of cheating in online or in face-to-face classes.

As discussed earlier, student cheating in tertiary institutions has long been recognized as a widespread phenomenon long before the COVID-19 pandemic set in. Research conducted during the COVID-19 period suggests that the increase in online teaching and online examinations has further intensified cheating as this is easier done in online modes compared to face-to-face situations (e.g., Bilen & Matros, 2021; Elsalem et al., 2021; Janke et al., 2021; Walsh et al., 2021). For example, Bilen and Matros (2021) reported that cheating in exams amid the COVID-19 pandemic has been detected in many universities across the world and concluded that "online cheating will only get much worse" (p. 198). Janke et al. (2021) conducted a study among 1608 students from several higher academic institutions in Germany and documented that students admitted higher rates of cheating in online exams than in on-site exams. Precisely, Janke et al. found that, while 61.4% of students who took their exams online reported engagement in cheating, only 31.7% of students who took their exams on-site reported such behavior.

The findings of studies on student academic dishonesty in several Middle Eastern countries (e.g., Jordan, Lebanon, Saudi Arabia, UAE) before the COVID-19 pandemic are quite similar to the findings of studies conducted elsewhere. That is, cheating is rampant across institutions and disciplines including business (Ghanem and Mozahem, 2019; Williams et al., 2014), engineering (Ghanem and Mozahem, 2019; Tabsh et al., 2017), humanities and social sciences (Ahmed, 2018), and medicine (Abdulghani et al., 2018). However, it may be noted that students in Middle Eastern universities have a more positive attitude toward different forms of cheating (e.g., Ghanem & Mozahem, 2019; Williams et al., 2014) and engage in higher rates of cheating than students studying in U.S. universities (e.g., McCabe et al., 2008). In the study by Williams et al. (2014), conducted among undergraduate business students from the US and the UAE, it was found that, while 71% of all respondents admitted to academic misconduct in their previous academic year, business students in the UAE were less likely to perceive several cheating behaviors as serious cheating compared to business students in the US. Khan and Balasubramanian (2012) surveyed undergraduate students (N = 224) in UAE universities and found that students admitted to higher cheating rates using technology or e-cheating. Although this study did not differentiate between online and in-person course formats, it does suggest an increase in cheating via the use of online technology. Recently, Thomas and Jeffers (2020) highlighted academic dishonesty as major problem for universities in the Arab region and demonstrated the efficacy of mobile eye-tracking technology in detecting instances of academic dishonesty.

At the height of the pandemic period, academic dishonesty in Middle Eastern universities not only continued to prevail but it appears to have become even more widespread (Al Shbail et al., 2021; Ebaid, 2021; Guangul et al., 2020). For example, Ebaid (2021) conducted a study among accounting students in Saudi universities and showed that cheating in online exams is a prevalent phenomenon as 93% of the participants reported that they had engaged in at least one incident of cheating during online exams. Along similar lines, Elsalem et al. (2021) reported that 45% of students in medical sciences at a large university in Jordan engaged in exam dishonesty or misconduct in the course of remote examinations. A recent study in the UAE offers a possible, but partial explanation, for the high incidence of cheating, that is certain cultural factors make Arab students perceive cheating in a different light compared to their peers elsewhere (Aljurf et al., 2020).

3. Theoretical background and proposed models

3.1. Theory of planned behavior

Ajzen's (1985, 1991) theory of planned behavior (TPB) is one of the most insightful theories of the decision-making process that can help understand when and whether a student decides to cheat or not to cheat. The TPB proposes four major predictors of human behavior: (a) *attitude toward the behavior* (b) *subjective norm*, (c) *behavioral intention*, (d) and *perceived behavioral control*. Ajzen (1985) defines *attitude toward the behavior* as "the individual's positive or negative evaluation of performing the behavior" in question and *subjective norm* as "the person's perception of the social pressures put on him to perform or not perform the behavior in question" (p. 12). Ajzen (1991, p.181) defines *behavioral intentions* as "indications of how hard people are willing to try, of how much of an effort

they are planning to exert, in order to perform the behavior” under consideration. *Perceived behavioral control*, on the other hand, captures “people’s perception of the ease or difficulty of performing the behavior of interest” (Ajzen, 1991, p. 183).

An earlier version of the TPB is the theory of reasoned action (TRA) proposed by Fishbein and Ajzen (1975) and Ajzen and Fishbein (1980). An important feature that distinguishes the TPB from its earlier version (i.e., the TRA) is the addition of the perceived behavioral control construct as another key predictor of both behavioral intention and actual behavior. Ajzen and colleagues (e.g., Ajzen, 1985; Ajzen & Madden, 1986; Beck & Ajzen, 1991) argue for the inclusion of the perceived behavioral control construct to the TPB, especially in situations where the behavior under consideration is not completely under one’s volitional control, as it is the case in a cheating situation. In particular, Ajzen and colleagues contend that, although behavioral intention is an important antecedent of actual behavior, engaging in a specific behavior will depend not only on one’s behavioral intentions or desire, as suggested by the TRA, but also on one’s control over the behavior in question (Ajzen, 1985; Beck & Ajzen, 1991). For instance, a student might have positive attitudes toward cheating and supporting subjective norms regarding engagement in the cheating behavior, but the student still does not engage in the cheating behavior because the instructor/university is employing an effective system that detects and punishes students who cheat. Accordingly, the TPB posits that an individual’s behavioral intention is determined by three factors: (a) attitude toward the behavior, (b) subjective norm, and (c) perceived behavioral control (Ajzen, 1985; Ajzen & Madden, 1986). The TPB also proposes that an individual’s behavioral intention directly impacts an individual’s actual behavior. Furthermore, the TPB postulates that perceived behavioral control has both direct and indirect impact (through behavioral intentions) on a person’s actual behavior. In brief, the TPB predicts that individuals intend to perform a specific behavior when they have a favorable attitude toward it, when they believe that important others think they should perform it, and when they perceive that performing the behavior is under their control. The TPB also predicts that the higher the behavioral intentions and the perception of control over a behavior, the higher the engagement in that behavior. *Model A* in Fig. 1 presents a schematic representation of the theory of planned behavior.

Several studies have provided support for Ajzen’s (1985, 1991) theory of planned behavior in explaining why students cheat in face-to-face classes (e.g., Beck & Ajzen, 1991; Harding et al., 2007; Hendy & Montargot, 2019; Mayhew et al., 2009; Stone et al., 2009; Stone et al., 2010; Tongsamsi & Tongsamsi, 2016; Whitley, 1998). For example, Stone et al. (2010) used a sample of 241 business students and demonstrated that attitudes toward cheating, subjective norms regarding cheating, and the perceived control over the conditions of performing the cheating behavior directly predict intentions to cheat. Importantly, Stone et al. (2010) provided evidence that both perceived behavioral control and behavioral intentions are significant direct predictors of actual cheating behavior. Beck and Ajzen (1991) surveyed a sample of 146 psychology students and, in line with the propositions of TPB, found that attitudes toward cheating and perceived behavioral control were significant predictors of intentions to cheat; however, subjective norm did not emerge as a significant predictor of intentions to cheat. Beck and Ajzen (1991) also showed that intentions to cheat is an immediate predictor of actual cheating behavior. Consistent with the propositions of TPB, other researchers also demonstrated that intentions to cheat is an immediate antecedent of cheating behavior (e.g., Harding et al., 2007; Mayhew et al., 2009; Tongsamsi & Tongsamsi, 2016).

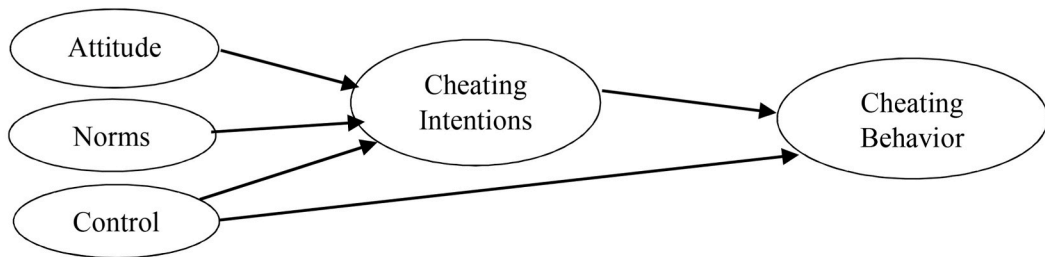
A number of studies have also examined the proposed direct and the indirect effects of perceived behavioral control on students’ actual cheating behavior (e.g., Harding et al., 2007; Mayhew et al., 2009; Stone et al., 2009, 2010). However, these studies reported mixed results. Specifically, while Stone et al. (2009, 2010) showed that perceived behavioral control has both direct and indirect impact (via cheating intentions) on business students’ actual cheating behavior, Mayhew et al. (2009) found only direct effect for perceived behavioral control on engineering students’ actual cheating behavior, and Harding et al. (2007) found neither direct nor indirect effect for perceived behavioral control on engineering students’ actual cheating behavior. In other words, Stone et al.’s (2009, 2010) findings indicate that behavioral intentions partially mediate the relationship between perceived behavioral control and actual cheating behavior, while the findings of Harding et al. (2007) and Mayhew et al. (2009) indicate the absence of mediation.

3.2. Expanding the TPB

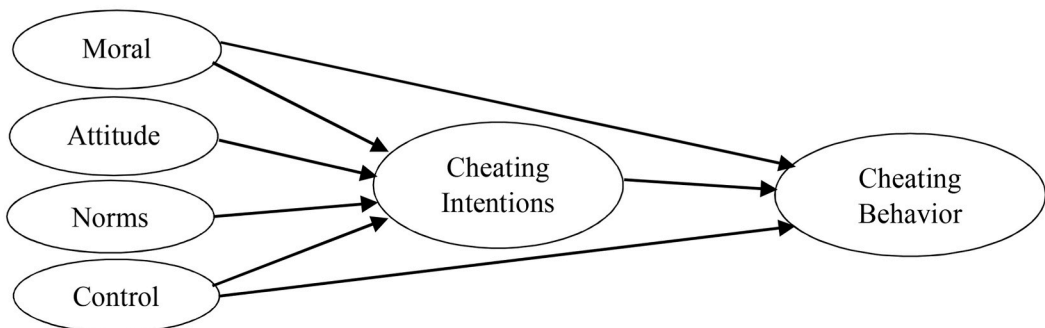
Based on prior research (Gorsuch & Ortberg, 1983; Pomazal & Jaccard, 1976; Schwartz & Tessler, 1972), Beck and Ajzen (1991) argue that the addition of *moral obligation* (a person’s feelings of responsibility to perform or not to perform a specific behavior) to the TPB would enhance the predictive power of the theory because a person’s moral obligation is likely to be a salient factor in the case of dishonest behaviors such as cheating. Beck and Ajzen (1991) examined the addition of moral obligation to the TPB and established that moral obligation is a significant predictor of both cheating intentions and actual cheating behavior. Mayhew et al. (2009) demonstrated that moral obligation is a significant predictor of cheating intentions but not actual cheating behavior. Harding et al. (2007) also included the moral obligation variable in their refined model of the TPB, but they treated it as part of a second order factor that captures three constructs: moral obligation, attitude toward behavior, and social norms. Results of Harding et al.’s (2007) study demonstrated that the second order factor (which includes moral obligation) significantly predicted intentions of cheating on tests. Based on the above research, we will test a model that includes moral obligation as predictor of both cheating intentions and actual cheating behavior. A schematic representation of the theory of planned behavior with the addition of moral obligation is shown in *Model B* in Fig. 1.

An important stream of research on academic cheating focuses on the role of individual/demographic and contextual factors in predicting students’ academic dishonesty/cheating. For example, McCabe and colleagues (McCabe et al., 2001, 2008; McCabe & Treviño, 1993, 1995, 1997) conducted a number of studies to identify the role of individual and contextual factors in predicting

Model A. Theory of Planned Behavior (TPB)



Model B. Theory of Planned Behavior (TPB) and Moral Obligation



Model C. Theory of Planned Behavior (TPB) and Empirical Research

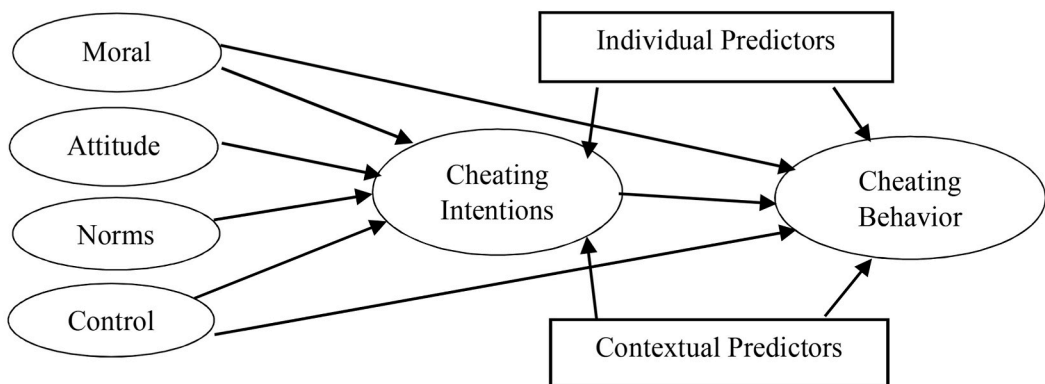


Fig. 1. Conceptual models of cheating predictors.

students' academic dishonesty/cheating behavior. Results from McCabe and colleagues' studies showed that gender, grade point average (GPA), and discipline are significant individual predictors of cheating. McCabe and colleagues¹ also found that peers' cheating behavior, severity of cheating penalties, and students reporting of cheating violations are contextual predictors of cheating. Other researchers (e.g., Harding et al., 2007; Mayhew et al., 2009) also found that scholarship status (with or without a scholarship) and university level (i.e., first year, second year, third year, fourth year) are other important individual predictors of cheating. However, Ajzen and colleagues (e.g., Ajzen, 1985; Ajzen & Fishbein, 1980) argue that demographic characteristics, personality traits, and other factors that are not explicitly included in the TPB should be treated as distal predictors because they have no direct effects on people's behaviors. Specifically, according to the TRA (Ajzen & Fishbein, 1980) and the TPB (Ajzen, 1985), even if demographic characteristics and personality traits might have an impact on a specific behavior, their effects will be through the predictors contained in the TPB. In other words, Ajzen and colleagues suggest that there is no need to include demographic characteristics and personality traits to predict behavioral intention and actual behavior because the effects of these variables are captured by the predictors proposed by the TPB. In line with Ajzen and colleagues' (e.g., Ajzen, 1985; Ajzen & Fishbein, 1980) proposition, Stone et al. (2010) also argue that McCabe and colleagues' perceptual variables such as peer's cheating behavior, disapproval of cheating (reporting of cheating violations), and severity of penalties for cheating represent the TPB components of norms and perceived behavioral control. We are unaware of any research that simultaneously includes the predictors proposed by the TPB and the major individual and contextual predictors of cheating that had been found in prior empirical studies (e.g., Harding et al., 2007; Mayhew et al., 2009; McCabe et al., 2001; McCabe & Treviño, 1993). Hence, in this study, we seek to expand the TPB by testing a comprehensive (Model C in Fig. 1) that integrates the TPB predictors and the major individual and contextual predictors that prior empirical studies have found to be related to cheating.

4. The aim of the study

This study aims to test three conceptual models (see Fig. 1) to identify the main predictors of academic dishonesty in online exams among undergraduate business students during the COVID-19 Pandemic. *Model A* captures the main variables and predictions proposed by the TPB. *Model B* is the same as Model A with the addition of moral obligation as a direct predictor of both cheating behavioral intentions and actual cheating behavior. *Model C* is the same as Model B with the addition of the major individual and contextual predictors that were found to be related to cheating in prior empirical studies. Testing the above three models will help identify which predictors are significant in the presence of the other predictors and will also help identify the amount of variance explained in cheating intentions and actual cheating by each model.

5. Methodology

5.1. Procedures

The data for this study came from a large questionnaire on academic dishonesty/cheating in the UAE among undergraduate students from different disciplines. To collect the data, we first obtained an ethical clearance from the ethical review office at a major university in the UAE. After receiving the ethical clearance, the director of the ethical review office of this university sent an e-mail to a random sample of around 1000 undergraduate students informing them about the current study. Specifically, the e-mail sent by the director provided information about the purpose of the study, background of the researchers, link of the online questionnaire, and statements encouraging students to participate and to share the questionnaire link with other students completing an undergraduate degree at any university in the UAE. The data was collected during February and March 2021 when almost all of the classes and examinations at universities in the UAE were conducted online due to the COVID-19 pandemic. Since classes were conducted online at the time of collecting the data, one of the authors also joined several online undergraduate classes and informed students about the study encouraging them to participate and share the questionnaire link with any student completing an undergraduate degree in the UAE.

To participate in this study, students need to click on the online link to the questionnaire. Upon clicking on the link, students were directed to the first part which provides the purpose of the study and the consent form. In the first part of the online questionnaire, participants were assured that the study is voluntary, confidential, anonymous, and their responses will be used for academic research purposes only. After voluntarily agreeing to participate in the study, participants were directed to the second part of the questionnaire which includes the main measures of this study (e.g., attitude toward cheating, intentions to cheat, subjective norm, perceived behavioral control, moral obligation, frequency of cheating behavior at the university, severity of cheating penalties, frequency of test/exam cheating, number of test/exam cheating). In the final part of the questionnaire, participants answered questions related to their gender, discipline, university level, scholarship status, nationality, and GPA.

5.2. Participants

A total of 216 undergraduate business students started the online questionnaire; however, only 176 students provided useful data. Although we received feedback confirming that students from different UAE universities participated in this study, we cannot specify

¹ McCabe and colleagues' studies also found that fraternity/sorority membership and existence of an explicit student honor codes are significant predictors in the U.S.; however, these two predictors have not been included in our study as they are not directly applicable to its context.

the name of the universities nor the number of participants from each university because we did not include any direct or indirect questions that identify the participants or their academic institutions. The characteristics of the final sample (176) is presented in Table 1.

5.3. Measures

Online test/exam cheating behavior. To measure this dependent variable, we followed Harding et al.'s (2007) approach by asking two questions with the addition of the word *online* to the two questions and responses in order to make them fit with the context of the present study. In the first question, participants were asked, "During the past year, how frequently did you cheat on online tests/exams at your university". Responses to this question ranged from 1 (*never*), 2 (*a few of the times I took an online test or exam*), 3 (*about half the times I took an online test or exam*), 4 (*almost every time I took an online test or exam*), to 5 (*every time I took an online test or exam*). In the second question, participants were asked, "During the past year, please indicate the number of times you had cheated on online tests/exams at your university". The frequency and the number of times questions were highly correlated; therefore, we used only the frequency item question in our analysis as done by Harding et al. (2007).

Cheating intentions. This variable was measured using a five-item scale with five-point response (*strongly disagree* = 1; *strongly agree* = 5) (Harding et al., 2007). A sample item is "I intend to cheat on a test/exam during the current academic term". Cronbach's alpha for this scale was 0.84.

Attitude toward cheating. This variable was measured using a series of seven-point semantic differential scale beginning with a stem "My attitude (opinion) toward cheating on a test/exam is ... (negative – positive; bad – good; unpleasant – pleasant; boring – thrilling; inferior – superior)" (Harding et al., 2007). Cronbach's alpha for this scale was 0.92.

Subjective norms. This predictor variable was measured using an eight-item scale with five-point response (*strongly disagree* = 1; *strongly agree* = 5). A sample item is "People whose opinions I value (e.g., my family, friends, colleagues, etc.) expect me to cheat on a test/exam" (Harding et al., 2007). Cronbach's alpha for this scale was 0.89.

Perceived behavioral control. This predictor variable was measured using a four-item scale with five-point response (*strongly disagree* = 1; *strongly agree* = 5). A sample item is "I believe that I would have a great deal of control over whether I get caught attempting to cheat on a test/exam" (Harding et al., 2007). Cronbach's alpha for this scale was 0.63.

Moral obligation. This predictor variable was measured using a three-item scale with five-point response (*strongly disagree* = 1; *strongly agree* = 5). A sample item is "Cheating on a test or exam is against my principles" (Harding et al., 2007). Cronbach's alpha for this scale was 0.71.

Students reporting of cheating violations. This contextual predictor was measured using a single four-point Likert-scale item that asked, "how likely is it that the typical student at your university would report cheating violations?" (McCabe & Treviño, 1993). Responses to this question ranged from 1 (*very unlikely*) to 4 (*very likely*).

Peers' cheating behavior. To measure this contextual predictor, we asked participants to indicate how frequently test cheating occurred at their university (McCabe & Treviño, 1993). Responses to this question ranged from 1 (*never*) to 5 (*very often*).

Severity of cheating penalties. Following McCabe and Treviño's (1993) approach, we measured this contextual predictor using a single four-point Likert scale item which asked respondents to rate the severity of penalties for cheating at their university. Responses to this question ranged from 1 (*very low*) to 4 (*very high*).

Individual/demographic variables. Participants were asked to indicate their gender, discipline, university level, scholarship status, nationality, and GPA.

Table 1
Characteristics of participants.

| Variable | Percentage | Variable | Percentage |
|-------------------------------------|------------|---------------------------------|------------|
| Gender | | Scholarship Status | |
| Male | 51.7 | With scholarship | 36.4 |
| Female | 48.3 | Without scholarship | 63.6 |
| Year-level at the university | | | |
| First year | 5.1 | Third year | 27.8 |
| Second year | 51.7 | Fourth year | 15.3 |
| Nationality | | | |
| Emirati | 23.3 | Palestinian | 3.4 |
| Lebanese | 9.1 | Canadian | 2.8 |
| Egyptian | 7.4 | Pakistani | 2.3 |
| American | 6.8 | Iraqi | 1.7 |
| Indian | 5.7 | Afghani | 1.7 |
| Jordanian | 4.5 | Yemeni | 1.7 |
| Syrian | 4.0 | Other nationalities | 25.6 |
| Grade Point Average (GPA) | | | |
| Mean of GPA = 3.08 | | Standard deviation of GPA = .54 | |

Note. N = 176.

Table 2

Means, standard deviations, reliabilities, and correlations.

| Variables | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|-------------------------------------------|------|------|------|--------|--------|--------|--------|--------|------|------|-----|------|------|------|----|
| 1. Online exam/test cheating ^a | – | – | – | | | | | | | | | | | | |
| 2. Intentions to cheat | 2.10 | 0.98 | .50 | (0.84) | | | | | | | | | | | |
| 3. Attitude toward cheating | 2.83 | 1.44 | .34 | .47 | (0.92) | | | | | | | | | | |
| 4. Subjective norm | 2.23 | 0.94 | .35 | .58 | .46 | (0.89) | | | | | | | | | |
| 5. Perceived behavioral control | 2.65 | 0.85 | .50 | .47 | .40 | .43 | (0.63) | | | | | | | | |
| 6. Moral obligation | 3.83 | 0.95 | –.42 | –.56 | –.51 | –.63 | –.48 | (0.71) | | | | | | | |
| 7. Students reporting of cheating | 1.66 | 0.91 | –.16 | –.14 | –.10 | –.07 | –.11 | .10 | – | | | | | | |
| 8. Peers' cheating behavior | 2.81 | 1.34 | .35 | .36 | .11 | .14 | .28 | –.18 | –.18 | – | | | | | |
| 9. Severity of cheating penalties | 3.25 | 0.99 | .08 | .02 | –.09 | –.01 | .02 | .03 | .15 | .13 | – | | | | |
| 10. Gender ^b | – | – | .02 | .06 | –.09 | –.03 | –.05 | –.07 | .03 | .13 | .12 | – | | | |
| 11. University level ^c | – | – | –.04 | –.02 | –.07 | –.07 | –.07 | –.03 | –.09 | .16 | .01 | –.05 | – | | |
| 12. GPA | 3.08 | .54 | .02 | .03 | –.12 | .01 | –.04 | .05 | .01 | .14 | .14 | .11 | –.13 | – | |
| 13. Scholarship ^d | – | – | –.06 | –.08 | .00 | –.03 | –.05 | .02 | .03 | –.01 | .00 | –.12 | .24 | –.32 | – |

Note. $N = 176$; scale reliabilities are in parentheses along the diagonal.

Correlations between 0.14 and 0.17 are significant at $p < .05$; correlations greater than 0.17 are significant at $p < .01$.

^a Online exam/test cheating: 0 = never cheated on an online test/exam, 1 = cheated on at least one online test/exam.

^b Gender: 1 = male, 2 = female.

^c University level = 1 = first year, 2 = second year, 3 = third year, 4 = fourth year.

^d Scholarship: 0 = no, 1 = yes.

6. Results

6.1. Preliminary data analysis

Prior to testing the three proposed conceptual models (Fig. 1) of this study, we screened the data to check for normality and other major issues. Screening of the data revealed that, similar to prior studies (e.g., Harding et al., 2007; Mayhew et al., 2009; McCabe & Treviño, 1997), the online test/exam cheating variable has a non-normal distribution. Specifically, 58.5% of the participants reported that they had never cheated on an online test/exam, 35.2% reported that they had cheated at least a few of the times, 3.4% reported that they had cheated about half the times, 1.1% reported that they had cheated almost every time, and 1.7% reported that they had cheated every time. To fix the non-normality problem with the online test/exam cheating variable, we performed several data transformation methods (e.g., logit and square root); however, none of the methods normalized the distribution. Therefore, we dichotomized the test/exam cheating variable as done by prior research (Harding et al., 2007; Mayhew et al., 2009). Specifically, we coded participants who never cheated on an online test/exam (58.5%) as “0” and those who cheated on at least one online test/exam (41.5%) as “1”.

After screening the data, we performed descriptive and correlation analyses for the variables of this study. Table 2 presents the means, standard deviations, scale reliabilities, and bivariate correlations. As shown in Table 2, online exam/test cheating has a significant *negative* relationship with moral obligation and students reporting of cheating violations, and it has significant *positive* relationships with intentions to cheat, attitude toward cheating, subjective norm, perceived behavioral control, and peers' cheating behavior. Table 2 also shows that intentions to cheat has a significant *negative* relationship with moral obligation and students reporting of cheating violations, and has significant *positive* relationships with attitude toward cheating, subjective norm, perceived behavioral control, and peers' cheating behavior. However, bivariate correlation analysis only assesses the relationship between two variables without taking in consideration the effect(s) of the other variables in the study. In other words, correlation analysis does not control for the effects of the other predictors. Therefore, the correlation results should be viewed as preliminary findings because they may not hold in a regression analysis or in structural equation modeling (SEM) analysis.

6.2. Structural equation modeling analysis

To test the three proposed conceptual models (see Fig. 1) of this study, we used structural equation modeling (SEM) analysis. SEM represents a group of statistical analysis techniques that help understand the structure of interrelationships expressed in a series of equations. The equations simultaneously analyze all the predicted relationships among the endogenous variables (equivalent to dependent variables) and the exogenous variables (equivalent to independent variables) of a specific conceptual model. In line with Anderson and Gerbing's (1988) recommendations, we first used SEM to evaluate the measurement models (Table 3) through confirmatory factor analysis (CFA) then we used SEM to evaluate simultaneously both the measurement models and the structural models (Table 4) of this study. To evaluate all the models in this study, we used χ^2 statistic, the comparative fit index (CFI), the root mean square error of approximation (RMSEA), the standardized root mean squared residual (SRMR), and the Tucker–Lewis index (TLI) (Bagozzi & Yi, 2012; Hu & Bentler, 1999; McDonald & Ho, 2002). For χ^2 statistic, nonsignificant values ($p > .05$) indicate a good fit. CFI and TLI values between 0.90 and 0.95 indicate “acceptable” fit, and values greater than 0.95 indicate “good” fit. RMSEA values between 0.05 and 0.08 indicate an “acceptable” fit, and values less than 0.05 indicate a good fit (McDonald & Ho, 2002). Values of 0.08 or less are preferred for SRMR (Hu & Bentler, 1999).

6.3. Confirmatory factor analysis (CFA)

To confirm the construct validity/distinctiveness of the five main variables (i.e., attitude toward cheating, intention to cheat,

Table 3
Comparison of Measurement Models in this Study.

| Model | Factor | χ^2 | $\Delta\chi^2$ ^a | df | Δdf ^a | RMSEA | SRMR | CFI | TLI |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------|-----|--------------------------|-------|-------|-------|-------|
| Model 1 (Proposed Model) | Five-factor model: attitude toward cheating, intention to cheat, subjective norm, perceived behavioral control, and moral obligation | 342.459 | – | 224 | – | 0.055 | 0.060 | 0.950 | 0.938 |
| Model 2 | Four factor model: attitude toward cheating, intention to cheat, subjective norm, and combination of perceived behavioral control and moral obligation | 456.159 | 113.700*** | 228 | 4 | 0.076 | 0.088 | 0.903 | 0.883 |
| Model 3 | Four factor model: intention to cheat, subjective norm, perceived behavioral control and combination of attitude toward cheating and moral obligation | 377.416 | 34.957*** | 228 | 4 | 0.061 | 0.062 | 0.936 | 0.923 |
| Model 4 | Two factor model: intention to cheat and combination of subjective norm, perceived behavioral control, attitude toward cheating, and moral obligation | 618.506 | 276.047*** | 233 | 9 | 0.097 | 0.085 | 0.836 | 0.806 |
| Model 5 | One factor model: all items grouped under a single factor | 749.356 | 406.897*** | 234 | 10 | 0.101 | 0.087 | 0.823 | 0.792 |

Note. ^a These values represent the difference in χ^2 and df between the alternative models and the five-factor oblique model (proposed model). Significant $\Delta\chi^2$ indicates that the five oblique factor model (proposed model) provides a better fit than the alternative models. *** $p < .001$.

Table 4

Path estimates and fit indices for the three proposed models in this study.

| | Model A: TPB | | Model B: TPB and Moral Obligation | | Model C: TPB and Individual and Contextual Predictors | |
|--------------------------------|---------------|-------------|-----------------------------------|-------------|-------------------------------------------------------|-------------|
| | To Intentions | To Cheating | To Intentions | To Cheating | To Intentions | To Cheating |
| Intentions | | .35*** | | .33** | | .24* |
| Attitude | .20* | | .15* | | .18* | |
| Subjective norm | .45*** | | .37** | | .31** | |
| Perceived behavioral control | .34** | .33*** | .31** | .33** | .12 | .27* |
| Moral obligation | | | -.20* | -.02 | -.19* | -.07 |
| Students reporting of cheating | | | | | -.03 | -.07 |
| Peers' cheating behavior | | | | | .20* | .18* |
| Severity of cheating penalties | | | | | .04 | .06 |
| Gender ^a | | | | | .02 | -.05 |
| University level ^b | | | | | .01 | -.05 |
| GPA | | | | | .06 | .01 |
| Scholarship ^c | | | | | -.09 | .00 |
| R ² | .60 | .38 | .61 | .38 | .64 | .41 |
| χ^2 | 262.396 | | 375.303 | | 537.576 | |
| Df | 184 | | 245 | | 378 | |
| χ^2/df | 1.426 | | 1.531 | | 1.517 | |
| RMSEA | .049 | | .055 | | .049 | |
| SRMR | .058 | | .061 | | .057 | |
| CFI | .964 | | .946 | | .937 | |
| TLI | .954 | | .934 | | .917 | |

Note. ^a These values represent the difference in χ^2 and *df* between the alternative models and the five-factor oblique model (proposed model). Significant $\Delta\chi^2$ indicates that the five oblique factor model (proposed model) provides a better fit than the alternative models.

*** $p < .001$. ** $p < .01$. * $p < .05$.

^a Gender: 1 = male, 2 = female.

^b University level = 1 = first year, 2 = second year, 3 = third year, 4 = fourth year.

^c Scholarship^c: 0 = no, 1 = yes.

subjective norm, perceived behavioral control, and moral obligation) used in the current study, we conducted a series of confirmatory factor analysis (CFA). As shown in Table 3, the five-factor proposed model (including scales of attitude toward cheating, intention to cheat, subjective norm, perceived behavioral control, and moral obligation) has the best fit indices [χ^2 (224) = 342.459, $p < .001$, $\chi^2/df = 1.528$, RMSEA = 0.055, SRMR = 0.060, CFI = 0.950, TLI = 0.938] among the five test models (see Table 3). The factor loadings associated with each item of Model 1 were above 0.50 and significant in the expected direction. These results demonstrate the construct validity/distinctiveness of the five main variables and indicate that the common method variance problem is not a major issue in the study.

6.4. Results of the proposed conceptual models

After confirming the construct validity of the main measures of this study, we used SEM to simultaneously assess both the measurement models and the structural models (Anderson & Gerbing, 1988) associated with each of the three proposed models (see Fig. 1) of this study. As reflected in Table 4, Model A (which captures only the components of the theory of planned behavior) has very good fit indices [χ^2 (184) = 262.396, $p < .001$, $\chi^2/df = 1.426$, RMSEA = 0.049, SRMR = 0.058, CFI = 0.964, TLI = 0.954]. The coefficients of the paths from attitude ($\beta = 0.20$, $p < .05$), subjective norm ($\beta = 0.45$, $p < .001$), and perceived behavioral control ($\beta = 0.34$, $p < .01$) to cheating intentions are significant. Also, the coefficients of the paths from cheating intentions ($\beta = 0.35$, $p < .001$) and perceived behavioral control ($\beta = 0.33$, $p < .001$) to actual cheating behavior are also significant. Model A explained 60% of the variance in business students' cheating intentions and 38% of the variance in actual cheating behavior.

As shown in Table 4, Model B (which consists of the components of the theory of planned behavior and the moral obligation predictor) produces acceptable fit indices [χ^2 (245) = 375.303, $p < .001$, $\chi^2/df = 1.531$, RMSEA = 0.055, SRMR = 0.061, CFI = 0.946, TLI = 0.934]. The coefficients of the paths from attitude ($\beta = 0.15$, $p < .05$), subjective norm ($\beta = 0.37$, $p < .01$), perceived behavioral control ($\beta = 0.31$, $p < .01$), moral obligation ($\beta = -0.20$, $p < .05$) to cheating intentions are significant. Also, while the coefficients of the paths from cheating intentions ($\beta = 0.33$, $p < .01$) and perceived behavioral control ($\beta = 0.33$, $p < .01$) to actual cheating behavior are significant, the coefficient of the path from moral obligation ($\beta = -0.02$, $p > .10$) to actual cheating behavior is not significant. Model B explained 61% of the variance in behavioral intentions and 38% of the variance in actual cheating behavior.

As displayed in Table 4, Model C (which is the same as Model B with the addition of individual and contextual predictors) also has acceptable fit indices [χ^2 (378) = 537.576, $p < .001$, $\chi^2/df = 1.517$, RMSEA = 0.049, SRMR = 0.057, CFI = 0.937, TLI = 0.917]. As shown in Table 4, the coefficients of the paths from attitude ($\beta = 0.18$, $p < .05$), subjective norm ($\beta = 0.31$, $p < .01$), moral obligation ($\beta = -0.19$, $p < .05$), and peers' cheating behavior ($\beta = 0.20$, $p < .01$) to cheating intentions are significant; however, the coefficients of the paths from perceived behavioral control ($\beta = 0.12$, $p > .10$), students reporting of cheating ($\beta = -0.03$, $p > .10$), severity of cheating penalties ($\beta = 0.04$, $p > .10$), gender ($\beta = 0.02$, $p > .10$), university level ($\beta = 0.01$, $p > .10$), GPA ($\beta = 0.06$, $p > .10$), and

scholarship status ($\beta = -0.09, p > .10$) to cheating intentions are not significant. Additionally, while the coefficients of the paths from cheating intention ($\beta = 0.24, p > .05$), perceived behavioral control ($\beta = 0.27, p > .05$), and peers' cheating behavior ($\beta = 0.18, p = .05$) to cheating behavior are significant, the coefficients of the paths from moral obligation ($\beta = -0.07, p > .10$), students reporting of cheating ($\beta = -0.07, p > .10$), severity of cheating penalties ($\beta = 0.06, p > .10$), gender ($\beta = -0.05, p > .10$), University level ($\beta = -0.05, p > .10$), GPA ($\beta = 0.01, p > .10$), and scholarship status ($\beta = 0.00, p > .10$) to cheating behavior are not significant. Model C explained 64% of the variance in cheating intentions and 41% of the variance in actual cheating behavior.

7. Results of the indirect effects

As outlined earlier, the TPB predicts that behavioral intentions will mediate the effect of *attitude toward cheating*, *subjective norm*, and *perceived behavioral control* on actual cheating behavior (see Model A in Fig. 1). To test these indirect effects (mediation relationships), we used the bootstrapping and bias-corrected percentile method (Preacher & Hayes, 2008) through AMOS. In line with the TPB's predictions, the results of the bootstrapping and bias-corrected percentile method (see Model A in Table 5) confirmed that behavioral intentions significantly mediate the effect of *attitude toward cheating*, *subjective norm*, and *perceived behavioral control* on actual cheating behavior. As shown in Table 5, none of the indirect effect paths in Model B and C is significant.

8. Discussion

A wealth of empirical studies has demonstrated that academic dishonesty is a major problem in traditional face-to-face teaching mode in various disciplines and universities worldwide (Ahmed, 2018; Bowers, 1964; Holden et al., 2020). Recent studies conducted during the period of the COVID-19 pandemic also reveal that academic dishonesty in online assessment has been on the rise (e.g., Bilen & Matros, 2021; Janke et al., 2021). Although recent studies have shed light on the online cheating problem during the COVID-19 pandemic, most of these studies have been conducted in Western countries (e.g., Bilen & Matros, 2021; Janke et al., 2021; Walsh et al., 2021) and none of them have identified the significant predictors of online cheating among business students during the COVID-19 pandemic. Moreover, most of the studies on the online cheating problem are largely empirically driven rather than theory driven. Hence, the present study sought to fill this gap by drawing primarily on the theory of planned behavior (Ajzen, 1985, 1991) and prior empirical research findings on academic dishonesty (e.g., Beck & Ajzen, 1991; Harding et al., 2007; McCabe et al., 2008; McCabe & Treviño, 1993; Stone et al., 2010) in order to identify the significant predictors of academic dishonesty among university business students in a non-Western country, namely the UAE, during the COVID-19 pandemic.

The results of the present study provide strong support to the applicability and parsimony of the TPB in understanding the phenomenon of academic dishonesty in online examinations among undergraduate business students. Specifically, consistent with the propositions of the TPB (Model A), this study shows that students' favorable attitude toward cheating, norms supportive of cheating, and perceived control over the engagement in cheating are significant predictors of intentions to cheat in online exams. Supporting the TPB propositions, the findings of this study also demonstrate that perceived control over the engagement in online cheating is also a direct predictor of actual cheating behavior in online exams. Moreover, in line with the TPB, the present study demonstrates that cheating intentions mediates the effects of attitude toward cheating, norms supportive of cheating, and perceived behavioral control on actual cheating in online exams. These findings clearly indicate that when students have positive attitudes toward cheating, believe that people who are important to them (e.g., parents, friends, other students, teachers) tolerate cheating, and perceive that it is easy to cheat (cheating under their control), they develop intentions to cheat, which in turn leads to actual engagement in cheating.

Based on the SEM results from Model B, which sought to expand the TPB by incorporating moral obligation as another major predictor, this study shows that among business students moral obligation has a significant negative impact on cheating intentions, but not on actual cheating behavior. That is, the more students have a strong sense of moral obligation that cheating is against their principles the less likely they are to harbor intentions to cheat in online examinations. This result aligns with Mayhew et al.'s (2009)

Table 5

Unstandardized point estimate of the indirect effects and their 95% bias-corrected confidence interval using 5000 bootstrap samples.

| The indirect effect paths | Estimate path coefficient | Bias corrected 95% confidence interval | | <i>p-value</i> |
|----------------------------------------------------|---------------------------|----------------------------------------|-------|----------------|
| | | Lower | Upper | |
| The indirect effect paths in Model A | | | | |
| Attitude → Cheating intentions → Cheating behavior | 0.070 | 0.023 | 0.131 | 0.023 |
| Norms → Cheating intentions → Cheating behavior | 0.157 | 0.039 | 0.296 | 0.012 |
| Control → Cheating intentions → Cheating behavior | 0.117 | 0.033 | 0.313 | 0.009 |
| The indirect effect paths in Model B | | | | |
| Attitude → Cheating intentions → Cheating behavior | 0.049 | −0.045 | 0.151 | 0.292 |
| Norms → Cheating intentions → Cheating behavior | 0.121 | −0.017 | 0.351 | 0.068 |
| Control → Cheating intentions → Cheating behavior | 0.102 | −0.008 | 0.335 | 0.061 |
| Moral → Cheating intentions → Cheating behavior | −0.066 | −0.324 | 0.107 | 0.444 |
| The indirect effect paths in Model C | | | | |
| Attitude → Cheating intentions → Cheating behavior | 0.043 | −0.014 | 0.133 | 0.265 |
| Norms → Cheating intentions → Cheating behavior | 0.074 | −0.057 | 0.240 | 0.241 |
| Control → Cheating intentions → Cheating behavior | 0.029 | −0.039 | 0.273 | 0.211 |
| Moral → Cheating intentions → Cheating behavior | −0.046 | −0.681 | 0.042 | 0.503 |

findings that moral obligation only influences cheating intentions but not cheating behavior. Recall that the correlation analysis in Table 2 shows that moral obligation has a negative association with actual cheating behavior. Finding a significant association between moral obligation and actual cheating behaviors in the correlation analysis, but no significant impact for moral obligation on actual cheating behaviors in the SEM analysis, indicates that the effect of moral obligation ceases to exist when including the effects of *perceived behavioral control* and *cheating intentions*.

Based on the SEM results from Model C, which attempted to expand the TPB by incorporating a group of individual and contextual variables as predictors of cheating intentions and cheating behavior, this study reveals that none of the individual factors (gender, GPA, scholarship, university level) examined in this study has a significant impact on business students' cheating intentions or actual cheating behavior. Among the contextual factors (students reporting of cheating, peers' cheating behavior, severity of cheating penalties) investigated in this study, only peers' cheating behavior has a significant effect on students' cheating. Precisely, the more cheating in examinations occurred at a university, the more the students at that university have higher cheating intentions and actual cheating behavior. This finding supports McCabe and colleagues' argument that peers' behavior and university culture are important contextual predictors of cheating. Students who see others cheat and get away with it, may feel it is okay for them to cheat, and have the mentality of 'if others do it' it is okay for me to do it, to morally rationalize their actions. Perceiving that cheating is easy, as other have done it (and got away with it), students will more likely engage in cheating to boost their grades and GPA.

An important goal for this study was to compare the efficacy of the TPB model with two other models that attempted to expand the TPB (see Fig. 1 and Table 4). Results of structural equation modeling analysis for Model A, which captures only the TPB components, show that the predictors of the TPB explained 60% of the variance in cheating intentions and 38% of the variance in actual cheating behaviors. These results indicate that the TPB is better at predicting cheating behaviors than previous research models that focus mainly on individual and situational predictors (e.g., McCabe & Treviño, 1997).

Results of the structural equation modeling analysis for Model B, which sought to expand the TPB by including moral obligation as another major predictor, show that the predictors of Model B explained 61% of the variance in cheating intentions and 38% of the variance in actual cheating behaviors. Results of the structural equation modeling analysis for Model C, which attempted to expand the TPB by adding individual and contextual factors, reveals that the predictors of this model explained 64% of the variance in cheating intentions and 41% of the variance in actual cheating behaviors. However, although Model B and Model C increased the explained variance in predicting cheating intentions and actual cheating behaviors, the addition of moral obligation, demographic, and contextual factors generated relatively modest utility. Moreover, the addition of moral obligation, demographic, and contextual factors weakened and complicated the theoretical predictions offered by the TPB. Precisely, after the inclusion of moral obligation, gender, GPA, discipline, scholarship, university level, students reporting of cheating, peers' cheating behavior, and severity of cheating penalties to the original TPB model, the relationship between perceived behavioral control and cheating intentions become non-significant in Model C. Furthermore, the indirect effects (via behavioral intentions) for attitude toward cheating, norms supportive of cheating, and perceived control over cheating on actual cheating failed to reach a significant level in Model B and Model C.

8.1. Theoretical contributions

The current study is original in terms of testing the efficacy of the TPB and two alternative models that expands the TPB to identify the significant predictors of academic dishonesty in online examinations among university business students in a non-Western country. Findings of this study demonstrate the validity of the TPB in detecting the predictors of business students' cheating intentions and actual cheating behavior in a parsimonious way. Unlike the models of previous studies (see for example Model C of this study) that have used many individual and contextual factors to predict students' cheating intentions and actual cheating behavior, Model A of this study offers a more parsimonious and viable model to predict students' cheating intentions and actual cheating behavior in online examinations.

Utilizing the TBP, our study shed light on understanding the process of business students' engagement in online cheating. Specifically, our study demonstrates that business students are more likely to intend to engage in online cheating behavior when they have favorable attitudes toward cheating, when their social norms are supportive of cheating, and when they perceive that engagement in cheating behavior is under their control. In addition, the higher the cheating intentions and the perception of control over the engagement in cheating behaviors, the higher the actual engagement in cheating. These results extend prior research findings (e.g., Beck & Ajzen, 1991; Harding et al., 2007; Hendy & Montargot, 2019; Stone et al., 2010) by confirming the efficacy of the TPB in understanding the cheating process both in online settings and in a non-Western country, namely the UAE.

Model B and Model C, both of which attempted to expand the TPB, provided relatively very modest enhancement in predicted cheating intentions and actual cheating behavior. This finding provides support for Ajzen and colleagues' (e.g., Ajzen, 1985; Ajzen & Fishbein, 1980) argument that there is no need to include/assess individual characteristics and other constructs that are not included in the TPB because the effects of these variables are captured by the main predictors offered by the TPB. Similarly, these findings are in line with Stone et al.'s (2010) argument that "McCabe & Treviño's perceptual variables such as perception of peer's cheating behavior, disapproval of cheating, and severity of penalties represent the TPB components of norms and perceived behavioral control" (p. 42).

8.2. Practical contributions

Based on the findings of this study and prior related studies, we recommend that academic administrators and faculty members, especially in business schools, spend more time and efforts educating students and establishing clear rules/policies on what constitutes cheating and on the negative impact of cheating on students, workplace, and society in order to form unfavorable attitudes toward

cheating. Such efforts need to take place through early orientation programs, course syllabi, establishment of codes of conduct/honor and Honor Board/Ethics Committee, ethic courses, and so forth (e.g., McCabe, 2016; McCabe et al., 2006). However, the answer to cheating is not simply to establish rules and policies –there is no lack of them after all- but to make sure that the established rules and policies are indeed implemented. In this regard, and alongside promoting social norms that depict cheating as unacceptable, disgraceful, and harmful, academic administrators, faculty members, and even students must make it absolutely clear that no cheating is small enough to avoid being reported through the proper mechanism to the body that has been set up to specifically deal with it (e.g., Honor Board/Ethics Committee) instead of sorting it out between the professor and the student as though it is an issue of concern to these two parties alone. Impressing upon students that acts of cheating are penalized and have negative implications for themselves and others that extend beyond the confines of a single class is crucial, as many students view cheating as an exercise with a calculated risk/benefit where the benefits, due to leniency or even lack of action by those responsible for upholding academic integrity, are often worth the risks.

Following the findings of this study and prior research (Harding et al., 2007; Stone et al., 2009, 2010) that students with high perceived control over engagement in cheating have higher cheating intentions and actual cheating behavior (based on Model A), university administrators and faculty alike must take appropriate actions to make students perceive/know that engagement in cheating is difficult and that there are effective mechanisms to catch and punish violators of academic integrity (Hosseini et al., 2021).

Since prior research demonstrates that academic dishonesty is related to future negative behavior at the workplace and other aspects of life (e.g., Nonis & Swift, 2001; Sims, 1993), our study findings suggest that universities and societies need to take actions to form unfavorable attitudes and non-supportive social norms toward cheating, as early as possible, to avoid major problems in the future, at the workplace and other aspects of life.

8.3. Limitations and future research

Like any research, this study has potential limitations. First, this study employed a cross-sectional research design, hence future research utilizing a longitudinal design that examines academic dishonesty over time is most likely to shed further light on our findings. Second, this study relied on a self-selected sample. It is possible that self-selected participants who took part in this study are less likely to cheat than those who select not to participate. If that is indeed the case, then there is far more cheating taking place than reported in the findings of this study. Hence, future research needs to devise some strategy or mechanism to encourage participation by all students irrespective of their attitudes to academic dishonesty. Third, as is the case with prior research (e.g., Harding et al., 2007; Mayhew et al., 2009), the variable of the actual cheating behavior was not normally distributed. Although a number of transformation approaches were used, the issue of normality could not be fixed. Hence, we resorted to dichotomizing the cheating variable into cheating vs. not cheating as done by prior research (e.g., Harding et al., 2007; Mayhew et al., 2009); however, this may have reduced the statistical power of our analysis. Fourth, although this study has taken place during the period of the COVID-19 pandemic we believe that its findings will be equally applicable even after the pandemic has ended. This is because online teaching and online assessment are here to stay thanks to continuous developments and refinements in educational technology.

Since this study focused on understanding cheating in online examination from business students' perspective, future studies that focus on business faculty's perspective or both students' and faculty's perspectives definitely will enhance our understanding in this area. Future research that explicitly investigates whether, and to what extent, academic dishonesty predicts unethical behavior in workplace and society at large is also needed.

Model B and Model C in our paper expanded the TPB by relying mainly on prior empirical research with little theoretical bases; hence, we did not develop specific hypotheses. We recommend that future research expand the TPB by offering explicit hypotheses that draw specifically on well-established theory and integrate the proposed theory with the TPB. Furthermore, we recommend that future research expand on our study by testing moderators or even testing mediated-moderated relationships that might impact the links proposed by the TPB.

9. Conclusion

Academic dishonesty/cheating is a serious and widespread problem that needs the efforts of several stakeholders (e.g., academic administrators, faculty members, students, parents), to curb it, no matter what the pressures, circumstances and events being faced are. Its seriousness extends far beyond the classroom, to the workplace, to society at large and has negative repercussions on all stakeholders. It prevailed before the COVID-19, during the pandemic, and, likely, will prevail after the pandemic. This study draws on the TPB and demonstrates that business students are more likely to harbor engagement in online cheating behavior when they have a favorable attitude toward cheating, when the social norms are supportive of cheating, and when they perceive that engagement in cheating behavior is under their control. In addition, the higher the cheating intentions and the perception of control over the engagement in cheating behaviors, the higher the actual engagement in cheating. The findings of this study offer several theoretical and practical implications for academic administrators and faculty members.

Data availability

The data that has been used is confidential.

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